AD-A157 756 REPORT ON THE FINAL ACCEPTANCE TEST FOR CTS (COMPUTERIZED TRAINING SYSTEM..(U) HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA B HUNTER 22 OCT 76 1/1

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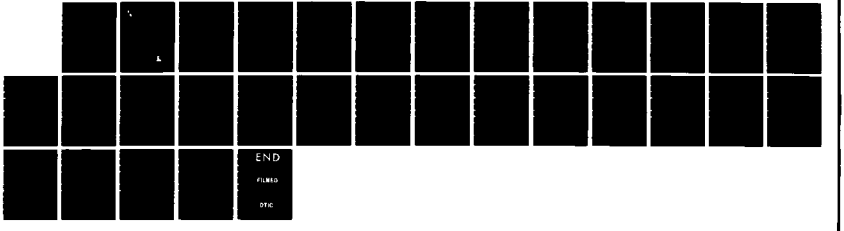

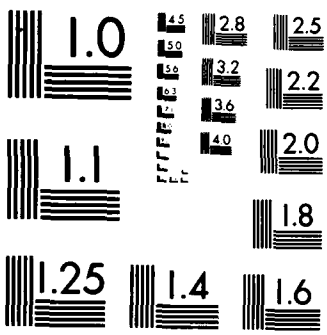

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PROJECT ABACUS

Report CTD-TR-76-2

AD_____

REPORT ON THE FINAL ACCEPTANCE TEST FOR CTS (COMPUTERIZED TRAINING SYSTEM)

Addendum

Beverly Hunter

22 ~~August~~ October 1976

AD A157756

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Prepared for:
US ARMY TRAINING AND DOCTRINE COMMAND
Fort Monroe, Virginia 23651

SOLDIER COMMUNICATORS
FORT GORDON
HOME OF THE SIGNAL CORPS

85 8 2 035

NOTICES

This report has been reviewed and is approved.

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REPORT DOCUMENTATION PAGE

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Curriculum Development	Self-paced Training	

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report describes the conduct and results of the Phase III Acceptance Testing on 23-27 February 1976, 22-23 March 1976, and 19-30 July 1976 at Fort Gordon, Georgia. The report summarizes the tests, results, and problems encountered. An addendum outlines follow-up actions by the contractor and the final acceptance by the government.

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ADDENDUM

TO REPORT ON THE
FINAL ACCEPTANCE TEST FOR CTS

During the period from 2 August 1976 through 24 September 1976, action was taken by the contractor, GTE-Sylvania, Inc., Needham Heights, MA, and US Army personnel, CTS Project, Fort Gordon, GA, to correct the deficiencies and problems found during the Phase III Acceptance Test described in this report.

Verification tests were performed over the period from 27 September 1976 through 8 October 1976. All corrections to the problems and deficiencies cited were completed to the satisfaction of the Army test personnel.

The delivery of the final report completed the contract requirements and the system was accepted for the government by the Contracting Officer's Technical Representative on 22 October 1976.

DONALD A. KIMBERLIN
ALTERNATE COTR

Availability Codes
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1.0 Purpose

This report describes the conduct and results of the Phase III Acceptance Test for CTS. This test was conducted on February 23-27, March 22-23, and July 19-30, 1976 at Fort Gordon. The purpose of this report is to provide an objective reference document for the use of the U.S. Army in making decisions on the acceptance of the CTS system and related contractual matters.

2.0 Test Objectives

The primary objectives of the test were to determine whether the full 128-terminal system will operate under operational live user conditions and meet contract requirements for reliability and response time. The ability of the system hardware and software to support individual user functions had been tested in Phases I and II.

3.0 Test Plan

Detailed procedures for the test are described in Appendix A: Phase III CTS Final Acceptance Test Plan. The test was conducted in five levels, corresponding to five test objectives, as follows:

Level I: Verification of Phase II Software Tests
Level II: Reliability
Level III: Verification of Phase II Class I Language Tests
Level IV: Response Time
Level V: Full Operational Load

4.0 Test Results

The results of the tests are described below with reference to the requirements for Phase III tests listed in modification no. P00006 to Contract No. DAHC26-74-C-0006.

4.1.0 Verification of Phase II Results: "Verify that the system software performs at the same level as when Phase II acceptance tests were conducted. Representative tests will be taken from the Phase II ATS and run to obtain verification."

4.1.1 Results: On February 23 and 24, 1976, test procedures for Levels I and III were followed. These tests verified that System Readiness, System Programmer functions, and the Class I Language commands operate satisfactorily (with exceptions noted in Section 5.1.0 of this report).

4.2.0 Reliability: "(4.1.2) The system must achieve a minimum of 95% up-time of the use time run 10 days of tests, using the running time meter. Up-time refers to the capability of the hardware and software to perform basic tasks of system initiation, program compilation, program execution, job management, file management, and program library maintenance."

4.2.1 Method for Testing Reliability: "(4.1.3) The Army will provide the contrator with a test course to be used in the acceptance test." "(4.3.3.1) The primary method of testing the full operational performance of the system shall be by extensive use of the system by students, instructional programmers, and administrators using an Army-provided test course."

It was not feasible for the Army to provide 128 live users for a ten day period to test reliability of the system under conditions of actual use. Therefore a simulator program was run during 65 hours of the test.

The simulator program consisted in a special Class I lesson that automatically and randomly presents a variety of displays over a range of from 10 to 40 seconds between displays. This lesson can execute unattended once it is initiated at a terminal. The set of random time intervals is generated at the start of the lesson and is unique each time the lesson is

executed. The lesson will cycle indefinitely and will only stop at log off. The simulated load condition is achieved by running this automatic display program asychronously at all terminals.

When the simulator program is operating with all 128 terminals, all hardware components of the system are in operation. Thus, the simulator provides a cinvenient and adequate method of testing hardware reliability.

This particular simulator program is not adequate for testing software reliability, however. The program does not generate all the software conditions that are encountered in full operational use with live users.

4.2.2 Results of Reliability Tests: The system achieved over 95% up-time during the 65 hours in which the system was exercised by the simulator program. When full operational performance of the system was tested with students, instructional programmers and instructors, the reliability was less than 50%.

Thus, the simulator program was demonstrated to be an inadequate test of system software reliability. The system was found not to meet reliability requirements under the conditions of the contract as stated in paragraph 4.2.1 above.

4.3.0 Response Time: Performance specifications for the 128 system state that there shall be a 90% probability that student response time shall be 2 seconds or less. No requirement is stated for Instructional Programmer response time.

4.3.1 Method for Testing Response Time: According to modification no. P00006 to Contract No. DAHC26-74-C-0006, paragraph 4.1.4, "The ability of the system to meet response time requirements will be tested through the simulator program that will measure performance under varying input loads.

The response times will also be tested through use of the system with a full complement of users on the 128 terminal system."

The simulator program described in paragraph 4.2.1 was used in combination with several increments of live users to test response times. (See Level [illegible] of the Acceptance Test Plan, Appendix A). The procedure is to log [illegible] terminals onto the simulator program. Then a specified number of the [illegible] are logged off the simulator and logged on by live students, in- [illegible] and instructional programmers. The live users thus "compete" with [illegible] users for response time. The live user response times were ob- [illegible] and timed as they interact with the system. Response time is defined [illegible] time elapsed between pressing the "NEXT" key and a change on the [illegible] screen.

[illegible] Level V, a full complement of 128 live users was planned to re- [illegible] times under non-simulator conditions. It was not possible to [illegible] response times under this condition because of system and Display [illegible].

[illegible] the simulator program does not adequately simulate opera- [illegible], and because response recordings could not be taken under [illegible] conditions, the response time results should not be [illegible] test of response time.

[illegible] Results of Response Time Tests: Response time recordings [illegible] three-hour period on July 27, under conditions described in [illegible] Acceptance Test Plan. Between 4 and 6 live students and one [illegible] (16-20 overall) were operating, with the remaining terminals [illegible] simulation mode. Under these conditions a total of 191 re- [illegible] mode of student response time. The results were as follows:

- 154, or 80%, of the student response times recorded were 1 second or less.
- 22, or 12%, of the recordings were between 1 and 2 seconds.
- 15, or 8%, of the recordings were greater than 2 seconds.

During portions of the test, from 1 to 2 Instructional Programmers operated per Display Controller (4-8 Instructional Programmers total per system). With one Instructional Programmer per DC, the average response time recorded was 11 seconds, with a range of from 1 to 24 seconds. With 2 Instructional Programmers per DC, the average was 43 seconds response time with a range of 1 second to 2 minutes.

The test plan calls for response time recordings under two additional conditions: with a background batch job and with a full load of 128 live users. It was not possible to obtain response time recordings under these conditions because the system would not operate reliably enough under these conditions to perform the tests.

4.3.3 Discussion of Response Time Results: Due to unreliability of the system under conditions of operational use, it was not possible to obtain a sufficient number of response time recordings to ensure that a representative sample had been made. Therefore we are unable to state with confidence whether or not the system meets response time requirements. Army instructional programmer personnel who have been using the system to develop and debug instructional programs have reported unacceptable delays in response time in instructional programmer mode. No complaints have been voiced about response time in student or instructor modes.

5.0 Problems

5.1.0 The Army CTS Field Office and the Signal School at Fort Gordon have been using the system for Instructional Programmer activities for several months. During this period they have been diagnosing and debugging the system, with some assistance from the contractor. Lt. David Wickert, the CTS Field Office systems programmer, has listed specific problems that have been recently discovered and not yet corrected. These are as follows:

5.1.1 DBC Addition Algorithm of Lesson Units: The DBC assigns too many bits in its lesson unit disk usage (LUDU) table for a lesson unit. A unit which was 6 blocks took up 12 blocks in the LUDU BITMAP. This results in both a fragmented disk and wasteful space on the disk. Software Systems Element: DBC Librarian. Status: GTE-Sylvania is investigating the problem.

5.1.2 User Mode TIB Execution: The TIB of the DC executive now executes in Kernel mode instead of user mode. Reference MFR, ATTNG-TA-TS-A, 18 Jan 76, subj: Removal of a DC Executive Protection Feature (Incl 1). Software Systems Element: DC Executive. Status: Problem has not been addressed by GTE-Sylvania at this point.

5.1.3 DC Executive Grabs DMA Channel to DBC: Under very heavy traffic to DBC, there is timing problem where the DC will grab the channel to the DBC, but has no means of releasing it. Software Systems Element: DC Executive. Status: Solution is known by GTE-Sylvania.

5.1.4 DBC Improper Handling of its 2nd Lesson Unit Output Buffer: DBC has 2-2 buffers for handling lesson unit transfers to either DC's or SC. Under heavy traffic loads or problem #3, the DBC is forced to use its second buffer. During normal operation, the 2nd buffer is not used. When the DBC tries to

reference its 2nd output buffer, it has clobbered an important register used to access the buffer. Thus, the 2nd output buffer is not cleared and outputed to DCs. Software Systems Element: DBC Librarian. Status: Solution is known by GTE-Sylvania.

5.1.5 CLASS 1 'LOAD' Command: After ASC 11 load into a multiword buffer, the CLASS 1 compiler is required to space fill the remainder of the buffer. The size of the buffer is being divided by 2 before use so that only half of the buffer is being space filled. Software Systems Element: CLASS 1 compiler. Status: GTS - Sylvania has rewritten routine.

5.1.6 CLASS 1'TAB' Command: 'TAB' routine in CLASS 1 compiler checks for valid row number instead of valid column number. Thus, any column number > 30 returns an error of 'illegal row number.'

5.1.7 DBC Dump of Table 'LUlxDU': The DBC librarian includes as part of its directory dump facility, the capability of dumping all of the tables in use at the DBC. All tables are included except table 'LUlxDU.' Although the SC does not provide the facility to request and print out these tables, they are included in the unit specification for DBC (reference page 390) and should be complete. Software Systems Element: DBC Librarian. Status: Solution is known by GTE-Sylvania.

5.1.8 Wrong total time in active user table at SC: Minus numbers are in AUT at SC after warm start. Software Systems Element: SC Software. Status: GTE-Sylvania is investigating.

5.1.9 'BACK' command not being executed properly: 'Branch to last restart point', when running as regular student is not going to DBC to get latest restart record of student. Instead, it is going to the DC disk. Software Systems Element: DC Executive. Status: Solution is known by GTE-Sylvania.

5.1.10 CLASS 1 'Table' command: the design plan (reference pag. 3-58) says there are two differences between the 'Table' and 'Common' command. First, the 'Common' command must be first command in unit, and, second, the 'Table' command defines data internal to unit only. Both differences are wrong. As presently implemented, there is no difference between the 'Table' and 'Common' commands. Software Systems Element: Class 1 Compiler. Status: GTE-Sylvania is investigating problem.

5.1.11 CLASS 1 command 'VANS' improper tolerance offsets: The lower tolerance limit on 'VANS' command is not being accepted as within tolerance. Software Systems Element: CLASS 1 Compiler or DC Executive. Status: GTE-Sylvania is investigating problem.

5.1.12 Editor lost line number: While operating the CTS editor, a line number offset was missed and lines were numbered incorrectly from that point. Software Systems Element: SC Editor. Status: GTE-Sylvania is investigating problem.

5.1.13 Nodepool Level Problem: The normal level of the SC RSX-11D nodepool is too low under heavy system load. At fresh reboot of system, the nodepool is 183 nodes. With light student load, the nodepool is 170 ± 15 nodes. Under heavy student load, the nodepool is 100 ± 20 nodes. Under almost full (30 students) and light IP (3 IPs) load, the nodepool is 70 ± 20 nodes. Under heavy student load, the nodepool falls below 50 nodes. These levels for the RSX-11D nodepool do not give an adequate safety margin under heavy student, IP and DC load. Software Systems Element: SC and RSX-11D Software. Status: GTE-Sylvania is investigating problem.

5.1.14 DC Executive Gets Improper SC message: Under heavy traffic, DC Executive appears to get an improper SC message which results in the DC

Level III Test Log (cont'd)

CLASS I Command/Condition	Execution	Compilation	Comments
end			
erase			
erase P1			
erase P1, P2			
erase P1, P2, P3			
erase P1, P2, P3, P4			
instmg P1			
instmg P1, P2			
kcms (several variations)			
kscore P1, P2[A], P3, P4, P5, P6, P7			
kscore P1, P2[A], P3, P4, P5,,P7			
kscore P1, P2[N], P3, P4, P5, P6, P7			
kscore P1, P2[N], P3, P4, P5,,P7			
load			
lock			
mult			
ncms (several variations)			
next			
nstt P1			
note			
randm (several variations)			
randm			
restrt P1, P2			

LEVEL III TEST LOG

Name of Monitor: _____

Name(s) of Test Operator(s): _____

Instructions: Put a check (✓) beside commands and conditions tested and [illegible] conditions or questions in the comments column.

Command/Condition	Execution	Compilation	Comments
P1 (statement label)			
P1 ($ unit name)			
P1 (statement label), P2			
P1 ($ unit name), P2			
(unconditional)			
(conditional)			
(switch setting)			
(range)			
P1, P2[A], P3, ...PN			
P1, P2[A], P3, ...PN			

PHASE III CTS FINAL ACCEPTANCE TEST PLAN

TEST MONITOR PROCEDURES AND LOG

Level III: CLASS I Commands 4 hours Moran Hall, Greeley Hall, Brant Hall

OBJECTIVES OF TEST

1. Ascertain that all CLASS I commands can be compiled and executed.

2. Ascertain that the CLASS I compiler will recognize and flag errors during compilation.

TEST PROCEDURES

1. Three versions of the test program will be in the system. One will be at the Data Base Controller (DBC) with "students" registered; another will be fully debugged source code; and the third will be source code with selected errors inserted.

2. Eight "students" and four "instructors" divided between the four DCs will sign on and execute the program as directed.

3. An IP will sign on and run a compile of the debugged program.

4. An IP will sign on and run a compile of the "bugged" program.

5. Procedures 2, 3 and 4 will be executed simultaneously.

MONITOR PROCEDURES

1. Terminal monitors for the four DCs will observe the execution of the test program by students and instructors. As each CLASS I command is tested, the monitor will check off that command on the Level III log sheet (attached).

2. The system monitor will observe the compilation of debugged and bugged program. Copies of the compilation listing will be retained and analyzed. Monitor will check off on the log sheet all commands and conditions that were compiled.

PHASE III CTS FINAL ACCEPTANCE TEST PLAN

TEST MONITOR PROCEDURES AND LOG

Level II: Reliability 80 hours Moran Hall, Greeley Hall, Brant Hall

OBJECTIVES OF TEST

1. Ascertain the system will meet the reliability requirements of 95% up time for ten 8-hour days of tests using the running time meter.

2. Ascertain that, on the average, all terminals will operate 76 of the total 80 hours.

TEST PROCEUDRES

1. The reliability test will commence with Level 1 and run concurrently with test levels 3, 4 and 5.

2. The load simulation program will be loaded and all terminals except those required for Levels 3, 4 and 5 will be activated under the simulator.

3. Other levels of test will be conducted.

4. System and terminals will be operated for a total of 80 hours.

MONITOR PROCEDURES

1. System monitor will maintain a system log (example attached) showing date and time Level II began, any downtime on any component, reason for downtime, and time up.

2. Terminal monitors at each cluster will maintain terminal logs (see attached). Monitors will log the time up for all terminals, time down, reason for down, and time back in service.

When a terminal failure occurs, the monitor for that terminal will:

(a) record the fact on the log

(b) record any symptoms and/or the operation taking place at the time

(c) communicate with central system to try to identify cause of problem

(d) record the time the terminal is back up

(e) record reason for downtime.

PHASE III CTS FINAL ACCEPTANCE TEST PLAN

TEST MONITOR PROCEDURES AND LOG

General Instructions to Test Monitors

1. The system monitor will be located in the computer room at Moran Hall. He will observe and record test activities taking place there, as indicated in test monitor procedures.

   The terminal monitors will be located at Moran, Greeley and Brant Halls. Each monitor will be assigned specific terminals.

2. Instructions to monitors are provided in the Test Monitor Procedures and Log for each test level. (Procedures for Level I are in a separate volume.) The test controller will inform the monitors when a test level is beginning or ending.

3. Monitors should obtain extra copies of necessary log sheets prior to beginning a test level.

4. Monitors will submit their logs to the test controller at the end of each test day.

(2) continued to the end; then rescheduled to a mutually agreed upon date. The running time clock set at 0.

e. All contractor requirements for support of the test will be coordinated by the COTR.

PARTICIPANT ROLES
PHASE III ACCEPTANCE TEST PLAN

1. The government will appoint a test controller. His duties will include:

a. Conducting the test in accordance with the test plan.

b. Determining when an element being tested meets or fails to meet specifications.

c. Controlling the monitors at the terminal sites.

d. Assuring that records and logs are properly maintained.

e. Conferring and consulting with contractor representatives. Bringing any unresolved problems to the attention of the COTR for resolution.

2. The contractor, GTE-Sylvania, will, at their option, provide a representative who will work with the government test controller in conducting the tests.

3. HumRRO, the government's test monitor, will monitor the test and provide reports to the Project ABACUS COTR in accordance with the condition of their contract.

4. USASIGS is invited to provide observers for the ATP III. The observers may provide comments, advice, and assistance to the COTR.

5. Duties of the terminal monitors provided by USASIGS and Project ABACUS include:

a. Recording of the appropriate data for each level of test for their terminals.

b. Supervision of personnel at their assigned terminals to ensure performance as required by the test plan.

c. Reporting and logging of all terminal malfunctions.

d. Supervision and control of terminals on site.

GUIDELINES FOR PHASE III ACCEPTANCE TEST

1. Test Administration.

a. One person from the government will direct and supervise the test.

b. All participants in the test will be so designated and their roles defined.

c. All personnel, i.e., programmers, maintenance personnel, instructors, students, etc., not designated as members of the test team, or specifically assigned, will not use the system in any manner while the test is underway.

d. Test plan should be followed, with changes as needed.

e. All persons performing test activities should keep detailed log of activities. Log should include time, response time, ATP paragraph number; if problem encountered, also conditions, input, results and retest requirements.

f. When a problem or exception is identified, it should be noted and the test proceed beyond that point. It is not feasible to diagnose all bugs in detail.

g. HumRRO will supply a more detailed procedure to follow for simultaneous users test so that test activities can be more carefully controlled. (Must be approved by the Army and Sylvania)

h. If system crashes, entire ATP section major paragraph to be retested.

2. Acceptance Test.

a. The Phase II Acceptance Test Plan will be reviewed in total.

b. Those elements that were shortcomings in the Phase II test will be especially monitored.

c. The ATP will be sequenced by test level as described in the test procedures.

d. All system down time will be logged. If the logged down time exceeds the 5% in 2 weeks, the test may be at the COTR's option:

(1) aborted and rescheduled at a date mutually agreed upon, with the running time clock set at 0.

Procedure.

1. Terminals will be signed on by 120 "students" and 8 "instructors" with the lesson material provided by DSB, USASIGS.

2. Student response latency samples will be taken as in Level 4 test.

3. Data from the students' responses will be collected on tape using the SAVSR command.

4. IPs will be signed on and procedures 5 and 6, Level 4, re-executed. This will take place when it has been determined that the system will perform satisfactorily with 128 "live" users.

2. Eight "students" and four "instructors" divided between the four DCs will sign on and execute the program as directed.

3. An IP will sign on and run a compile of the debugged program.

4. An IP will sign on and run a compile of the "bugged" program.

5. Procedures 2, 3, and 4 will be executed simultaneously.

LEVEL 4 4 hours Moran Hall, Greely Hall, and Brant Hall

Objectives.

Ascertain the system will meet the response time criteria as specified in the design plan.

Procedure.

1. Assign sixteen "students" and four "Instructors" to the system evenly divided between the controller.

2. Make certain the simulator is signed on for all other terminals.

3. On the signal given by the test controller, terminal monitors will take random response time samples.

4. The test controller will stop the recording of samples and sign on 8 "students" using the USASIGS prepared material. Random time sampling will be restarted as in para 3 above.

5. The test controller will stop recording and sign on 4 entry specialists and restart random sampling as in procedure 3.

6. The test cordinator will stop recording and sign on 4 IPs and restart recording as in procedure 3 above. The IPs will perform all normal functions except STURUN and ASSEMBLE. At a signal from the test controller, the IPs will execute STURUN and ASSEMBLE commands. Latency recording will restart.

7. At the conclusion of this test level, there will be the 36 "live" users and 92 simulated users.

LEVEL 5 4 hours Moran Hall, Greely Hall, and Brant Hall

Objectives.

Ascertain the system will perform in a satisfactory manner with 120 students and 8 instructors executing course material.

10. Data collected from Level 5 on tape will be processed through the Sort-Merge program to test the Sort-Merge and exercise the tape [illegible]

LEVEL 2 80 hours Moran Hall, Greely Hall and Brant Hall

Objectives.

1. Ascertain the system will meet the reliability requirements of 95% [illegible] time for ten 8-hour days of tests using the running time meter.

2. Ascertain that, on the average, all terminals will operate 76 of the total 80 hours.

Procedure.

1. The reliability test will commence upon successful conclusion of the Level 1 test and be run concurrently with test levels 3, 4, and 5.

2. The load simulation program will be loaded and all terminals except those required for Levels 3, 4, and 5 will be activated under the simulator.

3. Monitors at each cluster of terminals will record any shortcomings or failures. If a failure occurs, the monitor will immediately communicate with the central system to ascertain if the error is system or terminal related.

4. In order that the minimum demands are made on manpower and time, if the reliability test (level 2) has not been completed and all other levels are completed satisfactorily, then Level 2 will continue with only those persons present required to insure the successful conclusion of the test. This procedure will allow personnel from HumRRO, and GTE-Sylvania to return to their home stations without waiting for conclusion of level 2 test.

LEVEL 3 4 hours Moran Hall

Objectives.

1. Ascertain that all CLASS I commands can be compiled and executed.

2. Ascertain that the CLASS I compiler will recognize and flag errors during compilation.

Procedure.

1. Three versions of the test program will be in the system. One will be in the Data Base Controller (DBC) with "students" registered; another will be fully debugged source code and the third will be source code with [illegible] errors inserted.

TEST PROCEDURE
PHASE III ACCEPTANCE TEST PLAN (ATP)

LEVEL I 4 hours Moran Hall

Objectives.

1. Ascertain the full 128 terminal system can be made ready for operation.

2. Ascertain that each type user can log on and perform those operations allowed. This will be tested in a single user mode and simultaneous user mode.

Procedure.

1. System operator will execute the system readiness test, ATP II, para 3.1.

2. System programmer will execute system programmer functions, ATP II, para 3.2.

3. An administrator will log on and execute a request (reference element 3.4.5 of the ATP II not tested on the first administration of ATP II).

4. Four IPs (one per DC) will log on and execute ATP II, para 3.4.

5. Four "students" and four "instructors" (one each per DC) will log on and execute ATP II, para 3.5.1 and 3.5.2.

6. Successful completion to this point will verify the functions of each user can be properly executed by the system in a single user mode.

7. Simultaneous user test will be conducted in accordance with para 3.6 of the Phase II ATP using the following mix of users:

   a. Four students per DC.

   b. Two instructors per DC, assigned to 2 students each.

   c. One IP per DC.

   d. One administrative user per system.

   e. One system programmer per system.

8. Successful completion of para 7 will terminate the first portion of Level 1 test.

9. At the successful completion of Levels 3, 4, and 5, the system will be set up to process those elements not tested in the original Phase II ATP.

Appendix A

ACCEPTANCE TEST PLAN

The contractor should be required to test thoroughly any patches before they are implemented on the operational copy of the software. The changes should also be made to the relevant software documentation. When the debugging and patching phase is completed, the contractor should be required to provide the Army with a complete reassembled copy of the software without patches.

6.0 Recommendation.

We recommend that the system not be accepted in its present status. Following debug of the DC software problems and conversion to the 6B version of RSX-11 by the contractor and CTS Field Office, the system should be re-tested for overall performance.

To facilitate testing, a new simulator should be developed by the Army which more accurately represents operational conditions.

halting (this is not a non-recoverable halt). Software Systems Element: DC Executive or SC Software. Status: GTE-Sylvania is investigating problem.

5.1.15 DC Executive executes wrong TIB: Under heavy traffic loads, the DC executive appears to have a timing problem where it attempted to ercute a new student's TIB before the data was read into the TIB from disk. This resulted in the processor halting (non-recoverable). Software Systems Element: DC Executive. Status: GTE-Sylvania is investigating problem.

5.2.0 The System Controller and Display Controller failures under heavy traffic conditions appear to be a function of both contractor software bugs in the DC's and inadequacy of the DEC RSX-11 operating system. The CTS Field Office with the assistance of the contractor are presently converting from the present version of RSX-11 (4A) to the more recent version (6B) which has improved file handling capability. For a discussion of this action, see memorandum dated 6 August 1976 from Mr. Allyn Evans, ATTNG-TC-AT-SE, "Report of Trip to Project ABACUS, Fort Gordon, 25-30 July."

5.3.0 System response time in Instructional Programmer mode was not specified in the contract. However, the delays experienced by IP's on the current system seriously degrade the productivity of the IP's. The new version of RSX-11 with its improved file handling techniques will likely result in faster IP response time. If response time is not greatly improved thereby, the IP function should be redesigned such that more of the editing workload be distributed to the DC's, thus reducing the heavy traffic load on the SC.

5.4.0 Complaints have been voiced by the CTS Field Office systems personnel regarding the nature of the program patches being provided by the contractor.

Level III Test log (cont'd)

CLASS	Command/Condition	Execution	Compilation	Comments
	[illegible] P1, P2, P3			
	return			
	[illegible]			
	[illegible] P3			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible] P2			
	[illegible] P1, P2			
	[illegible] P1, P2, P3			
	[illegible] P1, P2, P3, P4			
	[illegible] P1, P2, P3, P4, P5			
	[illegible] P1, P2, P3, P4, P5, P6			
	[illegible]			
	[illegible] (specified)			
	[illegible] (unspecified)			
	[illegible] $ P1			
	[illegible] $P1, P2, P3			
	[illegible]			
	[illegible]			
	[illegible] P3, P2, P3, P4, P5			
	[illegible] ,, P3, P4, P5			
	[illegible] P1, P2, P3, P4			
	[illegible] ,,, P3, P4			

PHASE III CTS FINAL ACCEPTANCE TEST PLAN

TEST MONITOR PROCEDURES AND LOG

Level IV: Response Time 4 hours Moran Hall, Greeley Hall, Brant Hall

OBJECTIVES OF TEST

Ascertain the system will meet the response time criteria as specified in the design plan.

TEST PROCEDURES

1. The test controller will assign sixteen "students" and four "instructors" to the system evenly divided between the four controllers. The test controller will inform students and instructors as to the ID numbers and courses to use for the test.

2. The monitors will make certain that all terminals are in operation, either in simulation mode or by live operators.

3. On the signal given by the test controller, terminal monitors will take random response time samples in the following manner:

   Beginning at a convenient place in the cluster, observe the interaction of one "student" and his terminal. Start your stopwatch when the student presses the NEXT key. Stop the watch when the system response begins to appear on the screen.

   Enter on your response time log (sample attached) the time of day, the type of user (student, instructor, IP, administrator), what type of activity (scoring a multiple-choice answer, compiling a program, etc.), and the response time measured on the stopwatch. The time of day entry is important because it will enable the test controller to determine the test conditions under which that response time was obtained.

   Move on to the next terminal in use by a live student or instructor, and repeat the above process. Continue to take response time measurements and make log entries until test controller gives the next instructions.

4. The test controller will stop the recording of samples and sign on 8 "students" using the USASIGS prepared material. Monitors will make random time sampling as in paragraph 3 above.

5. The test controller will stop recording and sign on 4 entry specialists. Monitors will restart random sampling as in procedure 3.

6. The test controller will stop recording and sign on 4 IPs and restart recording as in procedure 3 above. The IPs will perform all normal functions except STURUN and ASSEMBLE. At a signal from the test controller, the IPs will execute STURUN and ASSEMBLE commands. Monitors will continue time sampling.

7. At the conclusion of this test level, there will be 36 "live" users and 92 simulated users.

PHASE III CTS FINAL ACCEPTANCE TEST PLAN

TEST MONITOR PROCEDURES AND LOG

Level V | 4 hours | Moran Hall, Greeley Hall, Brant Hall

OBJECTIVES OF TEST

Ascertain the system will perform in a satisfactory manner with 120 students and 8 instructors executing course material.

TEST PROCEDURES

1. Terminals will be signed on by 120 "students" and 8 "instructors" using the lesson material provided by DSB, USASIGS.

2. Terminal monitors will take student response latency samples as in Level 4 test, using the response time log sheets.

3. Data from the students' responses will be collected on tape using the SAVSR command.

4. IPs will be signed on and procedures 5 and 6, Level 4, re-executed. This will take place when it has been determined that the system will perform satisfactorily with 128 "live" users.

5. Terminal monitors will note any problems encountered by users on the terminal logs.

END

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